

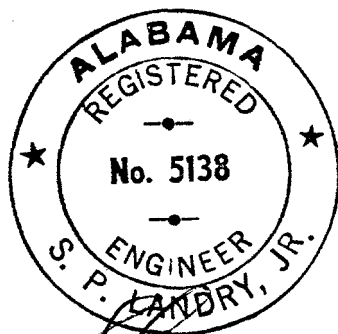
404/26A Permit Application For The Huntsville Remedial Action Plan

At
Huntsville, Alabama

lower Reach A

Prepared For

Olin Chemicals.



S. Landry

Project T184

Contract No. SE-HV-588-1893-C

WSNCo Project No. 86198

Sept. 1986

Nelson

Waldemar S. Nelson and Company
Incorporated
Engineers and Architects

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APPLICATION FOR

Department of the Army Permit

and/or

Tennessee Valley Authority Section 26a Approval

The Department of the Army (DA) permit program is authorized by Section 10 of the River and Harbor Act of 1899 and Section 404 of the Clean Water Act (P.L. 95-217). These laws require permits authorizing structures and work in or affecting navigable waters of the United States and the discharge of dredged or fill material into waters of the United States. Section 26a of the Tennessee Valley Authority Act, as amended, prohibits the construction, operation, or maintenance of any structure affecting navigation, flood control, or public lands or reservations across, along, or in the Tennessee River or any of its tributaries until plans for such construction, operation, and maintenance have been submitted to and approved by the Tennessee Valley Authority (TVA).

Two sets of original drawings on 8"x10-1/2" tracing paper or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings) and be submitted to the District Engineer and appropriate TVA office at the addresses listed below. An application that is not complete will be returned for additional information. Information in the application is made a matter of public record through issuance of public notice, if warranted. Disclosure of the information requested is voluntary; however, the data requested are necessary in order to communicate with the public and to evaluate the application. If necessary information is not provided, the application cannot be processed nor can a permit/approval be issued.

DA and TVA Main Office

District Engineer
U.S. Army Corps of Engineers
Post Office 60x 1070
Nashville, Tennessee 37202

Director of Land and Forest Resources
Tennessee Valley Authority
Norris, Tennessee 37828

TVA District Office Location

Western District
202 West Blythe Street
Paris, Tennessee 38242

Southern District
601 First Federal Building
102 South Court Street
Florence, Alabama

Central District
1101 Congress Parkway
Athens, Tennessee

Eastern District
2611 West Andrew Johnson
Highway
Morristown, Tennessee

Mailing Address

Manager of Properties
Division of Land and Forest Resources
Post Office Box 280
Paris, Tennessee 38242

Manager of Properties
Division of Land and Forest Resources
Tennessee Valley Authority
Muscle Shoals, Alabama 35660

Manager of Properties
Division of Land and Forest Resources
Post Office 60x 606
Athens, Tennessee 37303

Manager of Properties
Division of Land and Forest Resources
2611 West Andrew Johnson Highway
Morristown, Tennessee 37814

Name and Address of Applicant

Olin Corporation
120 Long Ridge Road
Stamford, CT 06904

Telephone Number

Home

Office 203/356-2000

Name, Address, and Title of Authorized Agent

Mr. John Oertling
Project Manager
5673 C4 Stewart Road
Redstone Arsenal, AL 35898

Telephone Number

Home

Office (205) 880-0372

Location where activity exists or will occur (include Stream Name and Mile, if known)

U.S. Army, Redstone Arsenal, Huntsville, AL
Huntsville Spring Branch
River Mile 2.4 to 4.0
(See accompanying drawings)

Application submitted to

DA ☒ ☐ ☐ ☐ ☐

TVA @ Yes ☐ No

Date activity is proposed to commence

Date activity is proposed to be completed

Names, addresser, and telephone numbers of adjoining property owners, lessees, etc., whose properties also join the waterway.

Commander
United States Army Missile Command
Attn: AMSMI-XK Building 112
Redstone Arsenal, AL 35898-5000

United States Dept. of the Interior
Fish and Wildlife Service
Refuge Manager
P. O. Box 1643
Decatur, AL 35601

List of previous DA/TVA permits/approvals

☐ DA N/A
Permit Number

☐ TVA N/A
Date

Is any portion of the activity for which authorization is sought now complete? ☐ YES ☒ NO

If answer is "Yes" attach Month and year the activity was completed

Indicate the existing work on the drawings.

List all permits or certifications required by other federal, interstate, state or local agencies for any structures, construction, discharges, disposal or other activities described in this application.

Issuing Agency	Type Approval	Identification No.	Date Of Application	Date Of Approval
Alabama Dept. of Env. Mgmt.	401 Certification			
U.S. Fish & Wildlife Serv.	Refuge Use Permit			
U.S. Army, Redstone Arsenal	Memorandum of Agreement			

Has any agency denied approval for the activity described herein or for any activity directly related to the activity described herein?

☐ Yes

☒ No

(If "Yes" attach explanation)

Describe in detail the proposed activity, its purpose and intended use (private, public, commercial or other) including description of the type of structures, if any to be erected on fills, or pile or float-supported platforms, the type, composition and quantity of materials to be discharged or dumped and means of conveyance, and the source of discharge or fill material. If additional space is needed, please attach additional sheets.

Olin Corporation proposes to construct a bypass channel around River Mile 3.4 to 2.4 of the Huntsville Spring Branch (HSB) located within the Wheeler National Wildlife Refuge on the U.S. Army Redstone Arsenal near Huntsville, Alabama. Additional project activities will include the filling of portions of the HSB channel between HSBM 4.0 and 2.4 with placement of material excavated on-site and trucked-in fill, construction of earthen diversion structures (sheet pile wall-supported), runoff diversion ditches, construction equipment access road(s), etc., all as presented in the attached project description and drawings. The Construction Sequence Schedule is also attached.

This project is mandated by the Consent Decree of May 31, 1983, entered into among Olin Corporation, the United States, and the State of Alabama. The stated purpose of the project as defined by the Consent Decree is "to isolate DDT in the Huntsville Spring Branch (HSB) - Indian Creek (IC) system from people and the environment and to minimize transportation of DDT out of the HSB-IC system." Bypassing and filling portions of the channel between HSBM 4.0 to HSBM 2.4 effectively isolates approximately 96% of the DDT in the channels and overbanks of Lower Reach A of the HSB-IC system. This project in combination with the channel bypassing of HSBM 5.5 - 4.0 (Upper Reach Remedial Action Project) effectively isolates 91.4% of the DDT contamination in the HSB-IC system. The basic components for the Remedial Action Plan were unanimously approved on August 31, 1984 by members of a Review Panel, which was established by the Consent Decree and consists of appointed

Application is hereby made for approval of the activities described herein. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

9-15-86

Date

Signature of Applicant or Authorized Agent

The application must be signed by the applicant; however, it may be signed by a duly authorized agent if this form is accompanied by a statement by the applicant designating the agent and agreeing to furnish upon request, supplemental information in support of the application.

1 U. S. C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up by any trick scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than five years, or both. Do not send permit processing fee with this application. The appropriate DA fee will be assessed when a permit is issued.

A. DA/TVA July 1979 Permit Application Form

(Description of Proposed Activity (Continued))

voting delegates from the U.S. Environmental Protection Agency, the U.S. Army, the Tennessee Valley Authority, the State of Alabama (Department of Environmental Management) and the U.S. Fish and Wildlife Service. Nonvoting members of the Review Panel include a representative from the town of Triana, Alabama and a representative from Olin Corporation.

B. PROJECT DESCRIPTION

The central element of Phase 11 of Olin's Remedial Action Plan is a diversion of the Huntsville Spring Branch (**HSB**) around the contaminated channel between HSBM 3.4 and 2.4. This section of the Huntsville Spring Branch is located within the Wheeler National Wildlife Refuge on Redstone Arsenal near Huntsville, Alabama (See Drawing **R1**). Primary project components (shown on Drawing **R2**) include:

- 1) Reoccupation of the North Staging Area for placement of construction trailers, **project** offices, equipment washing, etc. The North Staging Area was utilized previously in Upper Reach A (Phase I Remedial Action Project) construction activities.
- 2) Construction of a security fence around the project area, HSBM 2.4 to 4.0;
- 3) construction of access roads and bridge crossing;
- 4) excavation of a new channel between HSBM 2.4 and 3.4;
- 5) establishment of two stockpile areas for storage of excavated

fill material;

- 6) construction of four diversion structures, No. 4 from HSBM 3.40 to 3.90, No. 5 at HSBM 3.40, No. 6 at HSBM 2.66, and No. 7 at HSBM 2.55, and;
- 7) filling in of three areas of contaminated sediments and construction of swales to conduct surface drainage around the filled areas.

Each of these components is described below (not in construction sequence):

1) Reoccupation of the North Staging Area

The North Staging Area previously constructed during Phase I of the Huntsville Remedial Action Plan will be reoccupied. This five-acre site includes space for a contractor's office and storage areas, material storage, and private vehicle parking. Also included are equipment maintenance and washing facilities, fuel storage facilities, and a change house which provides a lunchroom, shower, and first aid facilities. Drawing R4 shows the North Staging Area in plan view. Access Road D will provide access between the North Staging Area and Lower Reach A (HSBM 4.0-2.4) as seen in Drawing R4.

2) Construction of a security fence

Prior to the start of construction, a four-foot high, **three-**

strand barbed wire project boundary fence will be erected around the perimeter of the site. The fence will be **11,605-feet** long and will extend the boundry of Upper Reach A. A gate at the intersection of Dodd Road and the levee will be required to allow Redstone Arsenal personnel access to the pumping station. An additional gate will be installed at the intersection of Roads D and G.

3) Construction of **access roads and bridge crossing**

Construction of access roads will be required due to the nature of the soils throughout the project area. Access Road G, approximately **4,420-feet** long, will connect with Access Road D and will provide access for construction of the new channel, construction of Diversion Structure No. 4, and filling of Area 1. The cross section of Access Road G is seen in Drawing **R6**.

To facilitate access **to** and construction in the area south of the new channel and west of Diversion Structure No. 5, a temporary stone bridge with five culverts placed at proper inverts will be constructed in the new channel. This temporary structure will allow normal flow through the channel while providing access to fill Areas 2 and 3 and Diversion Structures 6 and 7.

Access Road I, approximately **2,440-feet** long, will provide access for construction of Diversion Structures Nos. **5**, 6 and

7, and for filling of Areas 2 and 3. Cross sections of Diversion Structures No. 5, 6 and 7 are shown in Drawing R5. A cross section of Access Road I is shown on Drawing R6.

4) Excavation of a new channel

A new **1,490-foot** long channel will be excavated (i.e. dragline, backhoe, etc.) to a bottom elevation of 551.5 from HSBM 2.4 to 3.4 to divert the Huntsville Spring Branch around fill Areas 2 and 3. Approximately **26,400-cubic-yards** of material will be excavated from this 60-foot wide channel (bottom width) and will be stockpiled adjacent to the channel for use in the filling operations. A cross section of the new channel is shown in Drawing R6.

5) Establishment of stockpiles

Material excavated during construction of the new channel will be stored in two stockpiles. Stockpile Area 1 is on the north side of the new channel and will cover about 1.38 acres. Stockpile Area 2, on the south side of the new channel, will cover approximately 1.95 acres. Upon completion of the project, the stockpile areas will be graded **to** conform to surrounding **topography**, topsoil will be added, and the areas will be revegetated. A typical stockpile cross section is shown in Drawing R7.

6) Construction of Diversion Structures

Four diversion structures are required for Phase II of the Remedial Action Plan. To facilitate construction of Diversion Structures No. 4 and 5 the HSB flow may be temporarily channelized through culverts in the south levee. The flow will proceed along an existing drainage ditch and reenter HSB at approximately HSBM 2.5. The culvert pipes will be equipped with closure gates which can quickly be closed to prevent the impounding of water on Test Area 1. Each diversion structure will be built to an elevation of **561-feet** and will be of stone construction. Diversion Structures No. 4 and 5 will have a single wall sheet pile center core at various locations along their lengths. These locations can be seen in Drawing **R2**. Diversion Structures 6 and 7, due to their location in the HSB, will not require sheet piling. Diversion Structure No. 6 will be **130-feet** long and will be one of two diversion structures built to isolate Area 2. Diversion Structure No. 5, approximately 930-feet long, will be the second structure built to isolate Area 2. A cross section showing a typical section of structures Nos. 5 & 6 is shown in Drawing **R5**. Diversion Structure No. 4, approximately **2,600-feet** long will be located upstream of the new channel and will divert the flow around Area 1. A cross section of this structure is shown in

Drawing **R6.**

Diversion Structure No. 7, located downstream of the new channel, is approximately 450-feet long and will isolate Area 3. A cross section of this structure is shown in Drawing **R5.**

7) **Filling of Areas 1, 2, and 3**

Area 1 isolates 24.6 acres of contaminated HSB channel and overbank. This area will be filled to elevation 555-feet **MSL.** A **9-inch** layer of crushed stone will then be deposited atop geotextile fabric, followed by a soil layer g-inches to one-foot nine-inches thick. A 3-inch topsoil layer will be added and vegetated. The **soil fill** will consist of material excavated from the new channel, supplemented by **offsite** fill. A typical construction sequence for the fill areas is shown in Drawing R8.

Area 2 is located between Diversion Structures Nos. 5 and 6 and includes 6.9-acres of the Huntsville Spring Branch. It will be filled to an elevation of **554-feet** MSL with soil fill. The filling operation will thereafter be identical with Area 1.

Area 3, approximately **0.5-acres,** is located behind Diversion Structure No. 7. The filling operation will be identical to Area 2.

C. HYDRAULIC CONSIDERATIONS

Phase II of the Remedial Action Plan includes the installation of a new channel section of the Huntsville Spring Branch between HSBM 2.4 and 3.4 and the filling-in of portions of the former, bypassed channel. It is important that the hydraulic characteristics of the new channel be equivalent to or better than the existing channel so as to not cause any increased incidence of flooding within the Redstone Arsenal or upstream within the City of Huntsville. This was one of the seven objectives specified in the Consent Decree.

In order to design an equivalent or better channel, hydraulic modeling was performed to define the required cross sectional area of the new channel. This comparative modeling was performed using the HEC-2 Water Surface Profile Program as developed by the Hydrologic Engineering Center of the U.S. Army, Corps of Engineers (Version - November 1976, updated March 1982). It was determined that the new channel should have a bottom width of 60 feet and cut to a bottom elevation of 551.5 feet MSL.

The new channel was compared under a variety of flow conditions and pool stages to the existing HSB channel between HSBM 2.4 and 3.4. Lower Reach A was modeled based on profiles of 20 transects from surveyed data. These were supplemented with additional points to completely define the area between the existing levee to the south and the ridge to the north. The proposed Remedial Action Plan for Lower Reach A was modeled by modifying 11 of the original survey transects to include the Diversion

Structure No. 4 and Fill Area 1, and constructing an additional 10 sections from proposed sections and the existing topographic map. The water stage elevation at HSBM 3.9 was used as the reference backwater point for all flow and existing versus new channel comparisons. If the stage elevation at this point was the same or lower in testing the new channel hydraulics versus the existing channel, the new channel would be equal to or better with regard to hydraulic capacity and thus not have the potential to cause an increased incidence of flooding within the Redstone Arsenal or the City of Huntsville.

Flow conditions tested were 250 CFS and 7,000 CFS (10-year flood flow). Table 1 exhibits the results of the hydraulic modeling. Based on the modeling results, the net result of the filling activities in Phase II of the Remedial Action Plan is a reduction of flow area and causing a slight increase in hydraulic losses and flow elevations upstream. However, the **0.13-foot** increase in the 10-year flood elevation and the 0.45 foot increase at low flow in the HSB appears insignificant and within the range of model error.

D. PROJECT EFFECTS ON TVA FLOOD AND POWER POOL

- 1) Power Pool (elevation 550' to 556.') = **(-)46.8** net acre-feet (net-loss)
- 2) Flood Pool (elevation 550' to 579.') = **(-)89.4** net acre-feet (net-loss)

E. CONSTRUCTION SCHEDULE

The construction schedule shown on Exhibit 1 is designed to take

OLIN HUNTSVILLE REMEDIAL ACTION PLAN LOWER REACH "A" CONSTRUCTION SCHEDULE

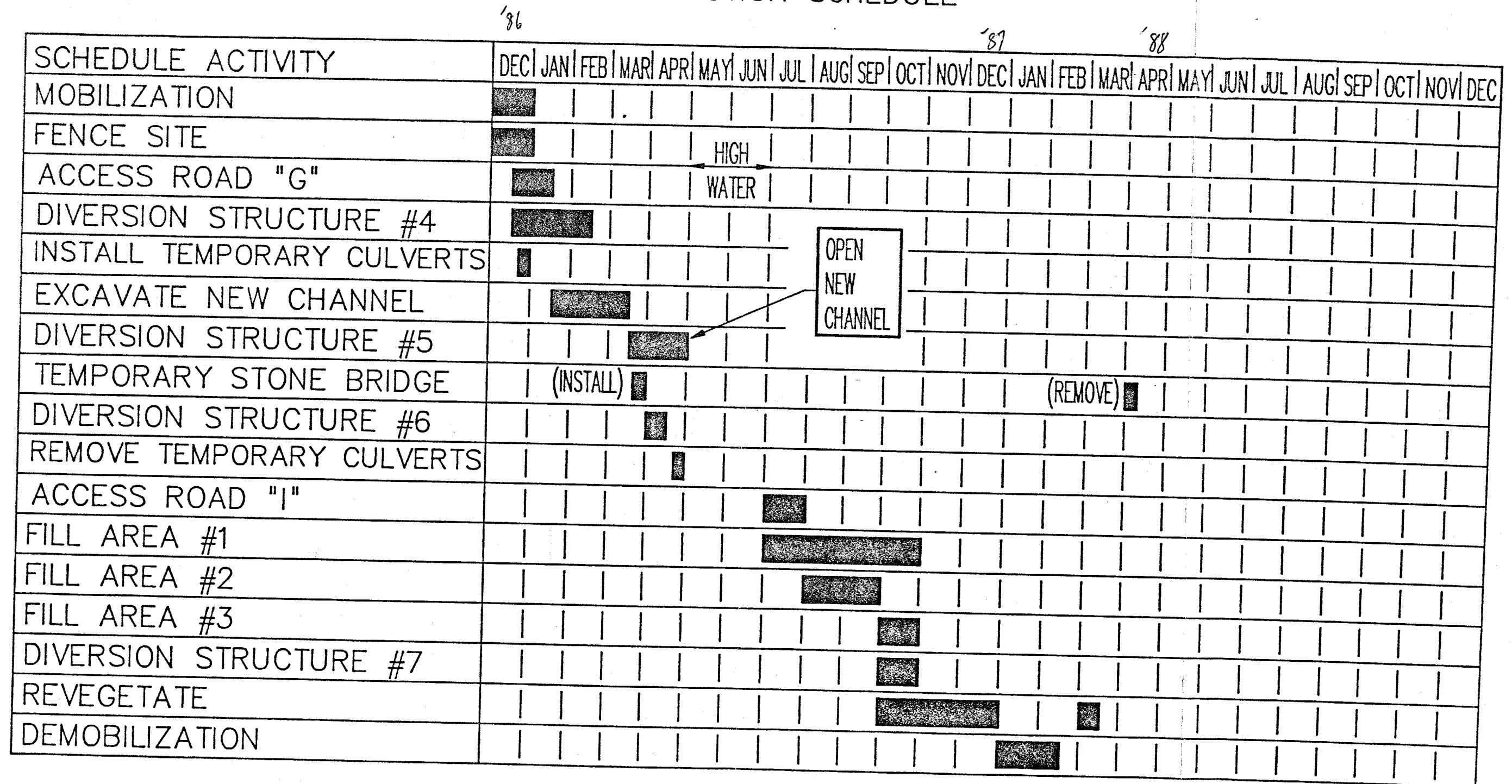


				EXHIBIT 1	
				CONSTRUCTION SCHEDULE	
				SCALE	DWG.
				NA	

NO.	REVISION	BY	DATE	DRAWN BY	DATE
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advantage of low water conditions (historical records from gaging station HSBM 2.4) for construction of access roads and diversion structures. Water levels are typically highest during April through July.

TABLE1

RESULTS OF HYDRAULIC MODELING

		HSBM 2.4 Elev.	HSBM 3.9 Elev.	Rise Ft.	Increase Ft.
<hr/>					
IO-Year Storm (Q = 7,000 CFS) -----					
Original	Conditions	564.90	565.35	+0.45	---
Recommended Action	Remedial Plan	564.90	565.48	+0.58	+0.13
 Low Flow Conditions (Q = 250 CFS) -----					
Original	Conditions	553.50	555.38	+1.88	---
Recommended Action	Remedial Plan	553.50	555.83	+2.33	+0.45

NOTE : A **100-year** flood event was evaluated to determine the impact of the Lower Reach A Remedial Action Project. Exhibit 2 shows the flood boundary for a **100-year** backwater flood. A backwater flood from the Wheeler Reservoir is more severe than headwater flooding from Huntsville Spring Branch and Indian Creek. Exhibit 2 shows widespread areas of inundation would result from the **100-year** flood event. By comparison, under this condition, the proposed modifications to the ground surface within Lower Reach A are insignificant and would have a negligible effect on the resulting severity of the flooding conditions.

F. WETLAND AND UPLAND IMPACTS

a) Uplands Vegetation

Implementation of Phase II of the Remedial Action Plan will necessitate some modification of upland vegetation communities. A portion of Access Road G will be constructed primarily in mixed pine-hardwood or planted pine forest. The approximate area involved is given in Table 2.

TABLE 2

ACRES OF UPLAND VEGETATION IMPACTED

Uplands Lost:

Access Road G	0.72 acres
	<hr/>
	0.72 acres

b) Wetland Vegetation

Similarly, implementation of the Remedial Action Plan will necessitate modification of wetland vegetation communities. Several types of modifications will be involved. In some instances, implementation of various elements of the project will require the permanent conversion of wetlands to non-wetlands. In other instances, one type of wetland may be converted either temporarily or permanently to another type of wetland habitat. The project elements which will affect wetland areas are:

construction of Access Roads G, and I; excavation of the new channel between HSBM 2.4 and 3.4; filling of Areas 1, 2, and 3; construction of Diversion Structures 4, 5, 6, **and** 7; and construction of Stockpile Areas 1 and 2. The type of modification and the approximate acres involved are given in Table 3.

TABLE 3

ACRES OF WETLAND VEGETATION IMPACTED

		Acres
1.	WETLANDS LOST	
a.	Access Roads	5.41
b.	Diversion Structures	3.16
2.	WETLANDS PERMANENTLY MODIFIED	
a.	Scrub/Shrub Swamp to Open Water	
1.	Excavation of New Channel	4.21
b.	Open Water to Either Mixed Pine/Hardwood Forest or Scrub/Shrub	
1.	Filling of Areas 1, 2, and 3	31.96
3.	WETLANDS TEMPORARILY MODIFIED (Until Revegetated)	
a.	Stockpiles 1 and 2	3.33
b.	Temporary Diversion Ditch and Berm	0.69
TOTAL		48.76

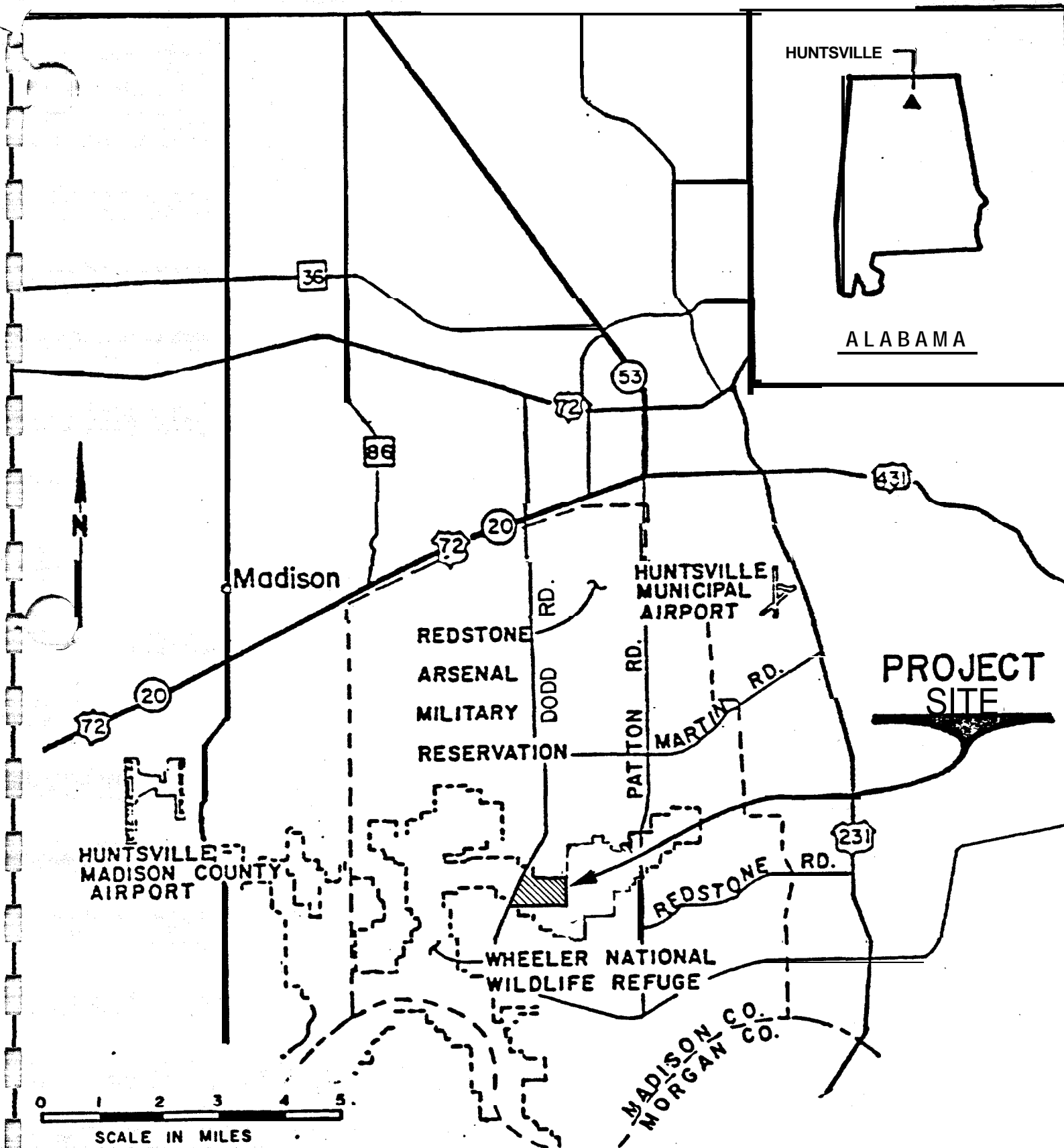
G. CUT AND FILL QUANTITIES

ACTIVITY	SOIL CUT (cy)	SOIL FILL (cy)	ROCK FILL (cy)
1. Access Road G		99	13,028
2. Excavate New Channel	26,399		444
3. Diversion Structure No. 6		-	1,683
4. Diversion Structure No. 4			35,036
5. Access Road I			6,597
6. Diversion Structure No. 5			7,130
7. Diversion Structure No. 7		-	6,308
8. Fill Area 1		53,253	15,971
9. Fill Area 2		21,523	6,833
10. Fill Area 3		2,074	656
	26,399	76,949	93,686

Soil From Off-site Source = 50,550 cy

Rock From Off-site Source = 93,686 cy

H. PERMIT APPLICATION DRAWINGS (Attached)



FOR PERMIT APPLICATION

WALDEMAR S. NELSON & CO., INC.
NEW ORLEANS, LA.
ENGINEERS AND ARCHITECTS

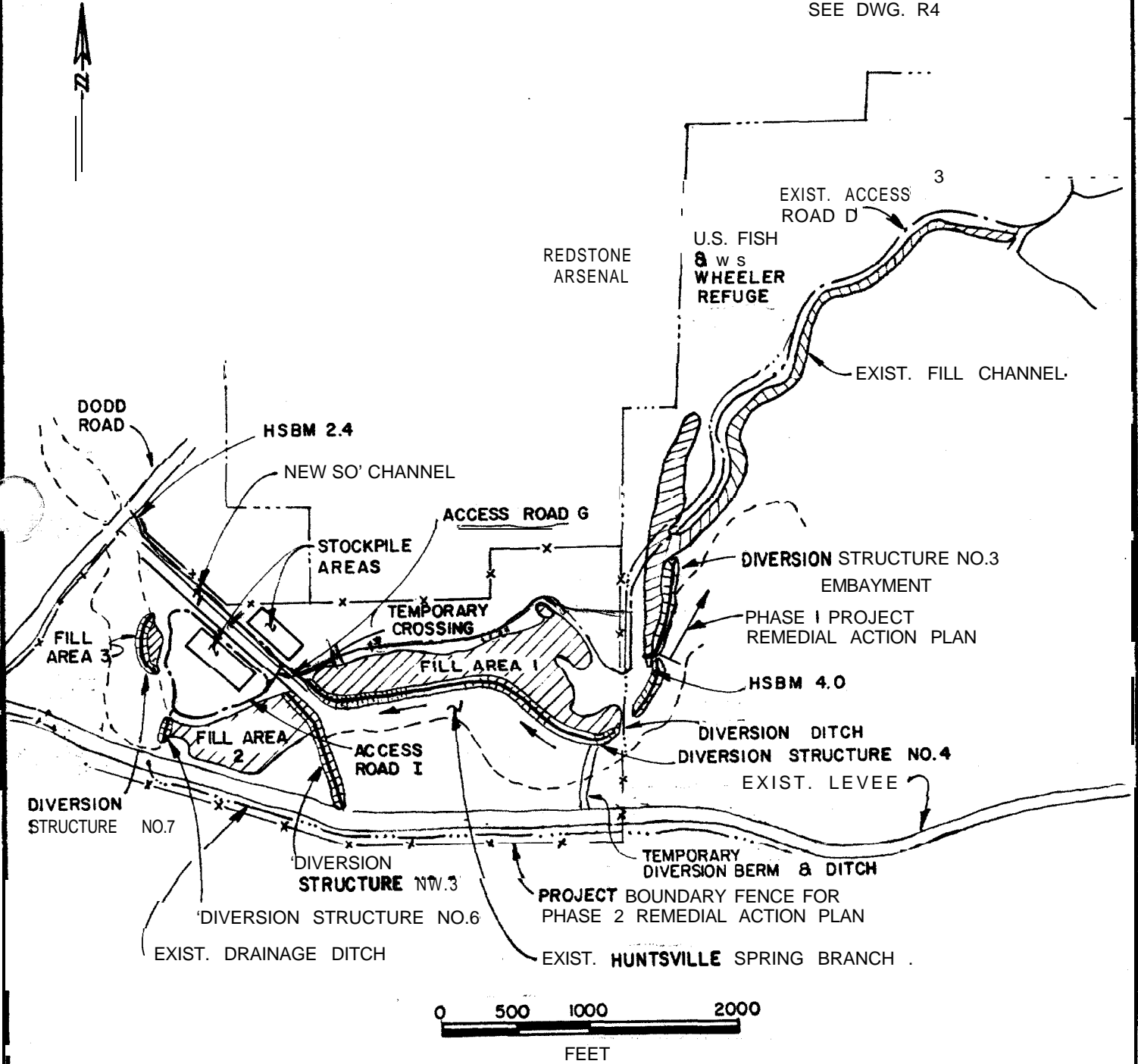
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HUNTSVILLE, ALABAMA
REMEDIAL ACTION PLAN
PHASE II
VICINITY MAP

DWG. RI OF 8	REV. 0
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NORTH STAGING AREA
FOR DETAILS
SEE DWG. R4



FOR PERMIT APPLICATION

Olin

HUNTSVILLE, ALABAMA
REMEDIAL ACTION PLAN

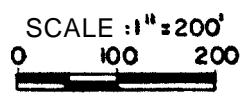
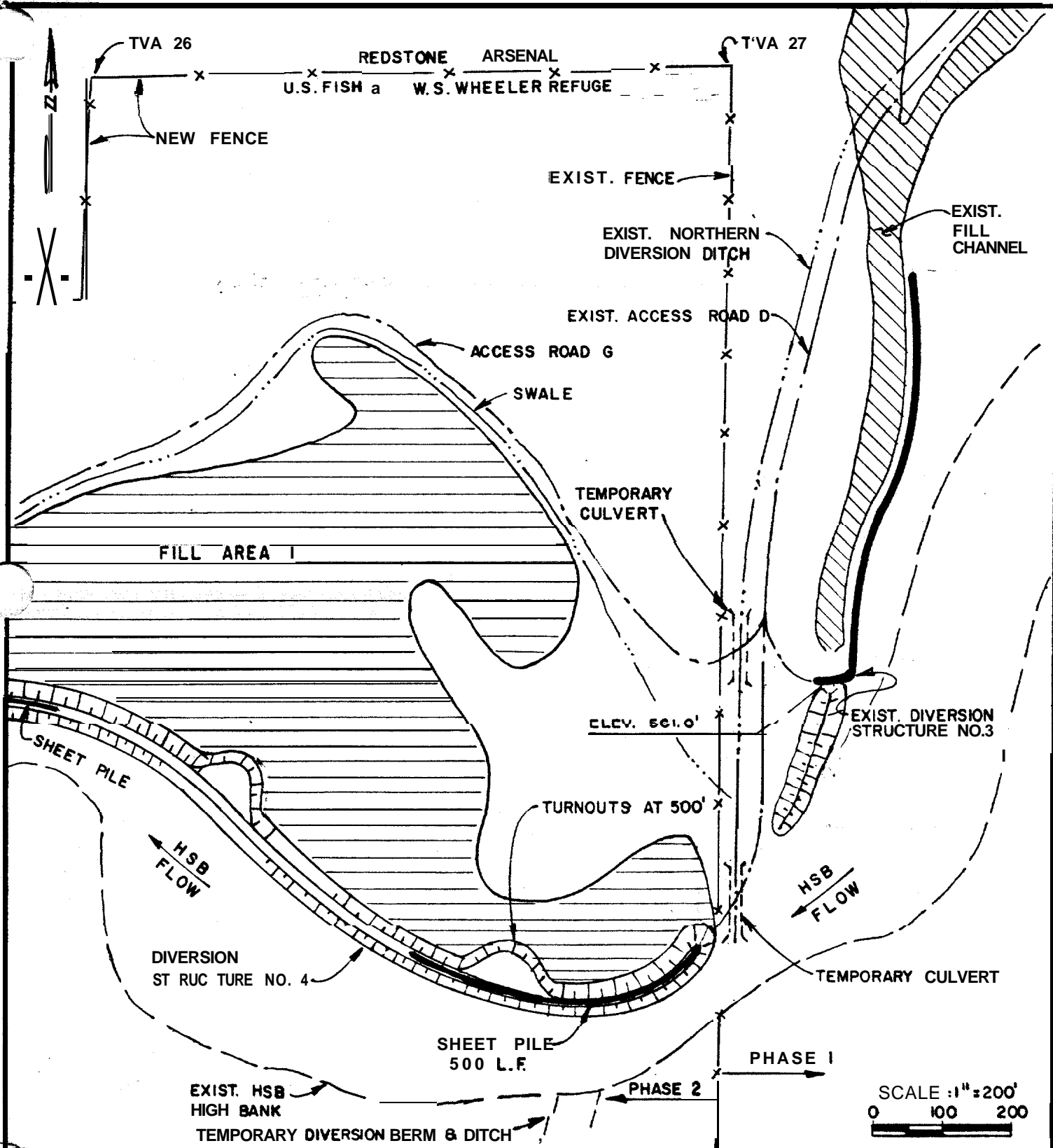
PHASE II
LOCATION MAP

WALDEMAR S. NELSON & CO., INC.
NEW ORLEANS, LA.
ENGINEERS AND ARCHITECTS

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DWG. R2 OF 8

REV.
P



FOR PERMIT APPLICATION



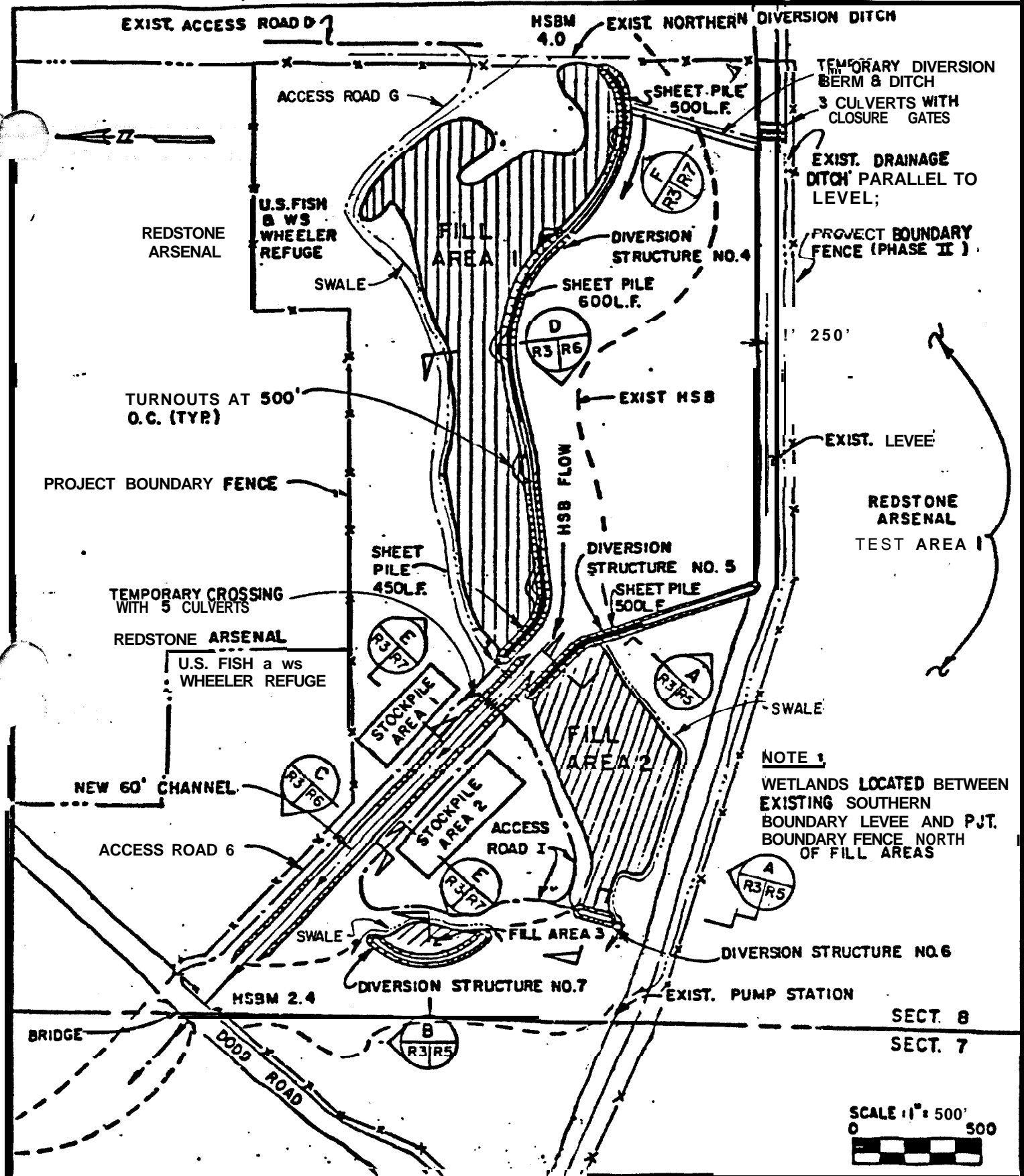
WALDEMAR S. NELSON & CO., INC.
NEW ORLEANS, LA.
ENGINEERS AND ARCHITECTS

DRAWN BY S.V.N.	DATE 8-4-86
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HUNTSVILLE, ALABAMA
REMEDIAL ACTION PLAN
PHASE II
UPPER/LOWER REACH A
CONNECTION DETAIL

DWG. R2A OF 8	REV. F
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TOWNSHIP 5 SOUTH, RANGE 1 WEST



OR PERMIT APPLICATION

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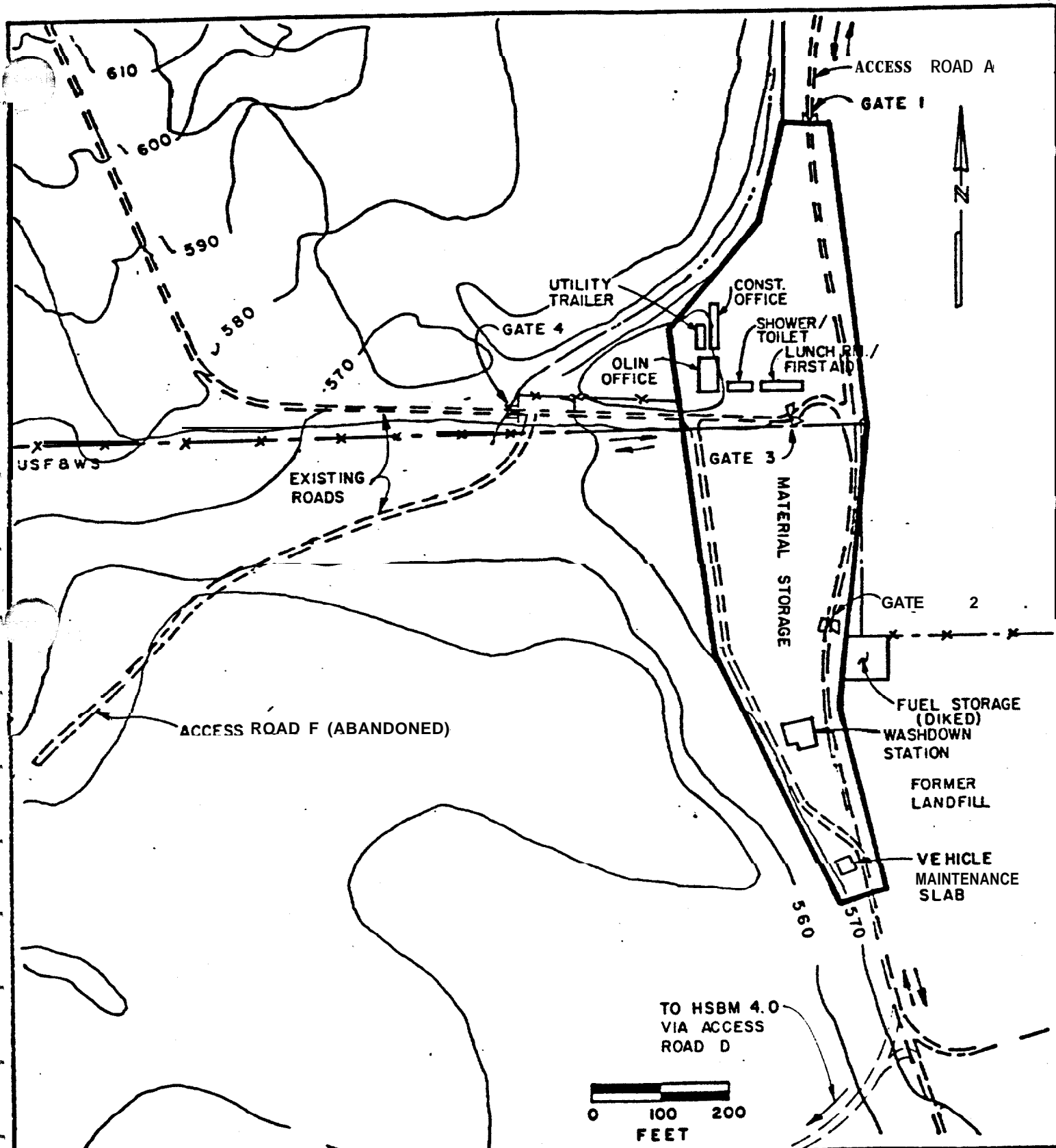
HUNTSVILLE, ALABAMA
REMEDIAL ACTION PLAN
PHASE II
CONSTRUCTION FEATURES

WALDEMAR S. NELSON & CO., INC.
NEW ORLEANS, LA.
ENGINEERS AND ARCHITECTS

DRAWN BY G.V.N.	DATE 6-10-86
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DWG. R 3 OF 8

REV. 1



FOR PERMIT APPLICATION

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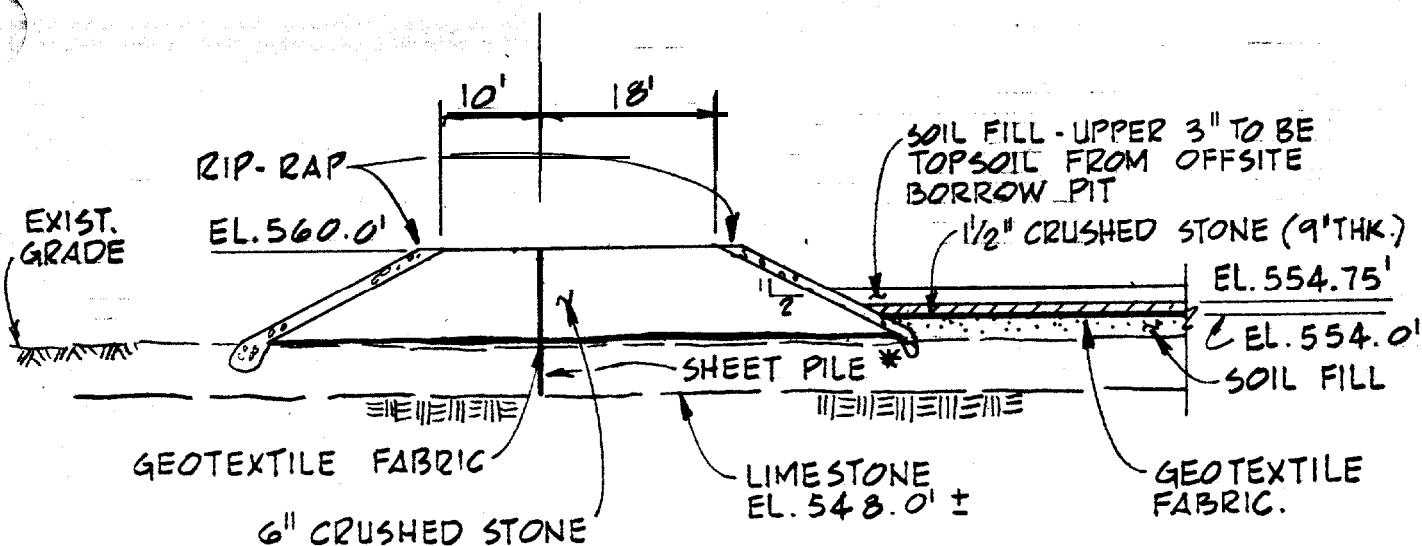
HUNTSVILLE, ALABAMA
REMEDIAL ACTION PLAN
PHASES I AND II
NORTH STAGING AREA

WALDEMAR S. NELSON & CO., INC.
NEW ORLEANS, LA.
ENGINEERS AND ARCHITECTS

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DWG. R 4 OF 8

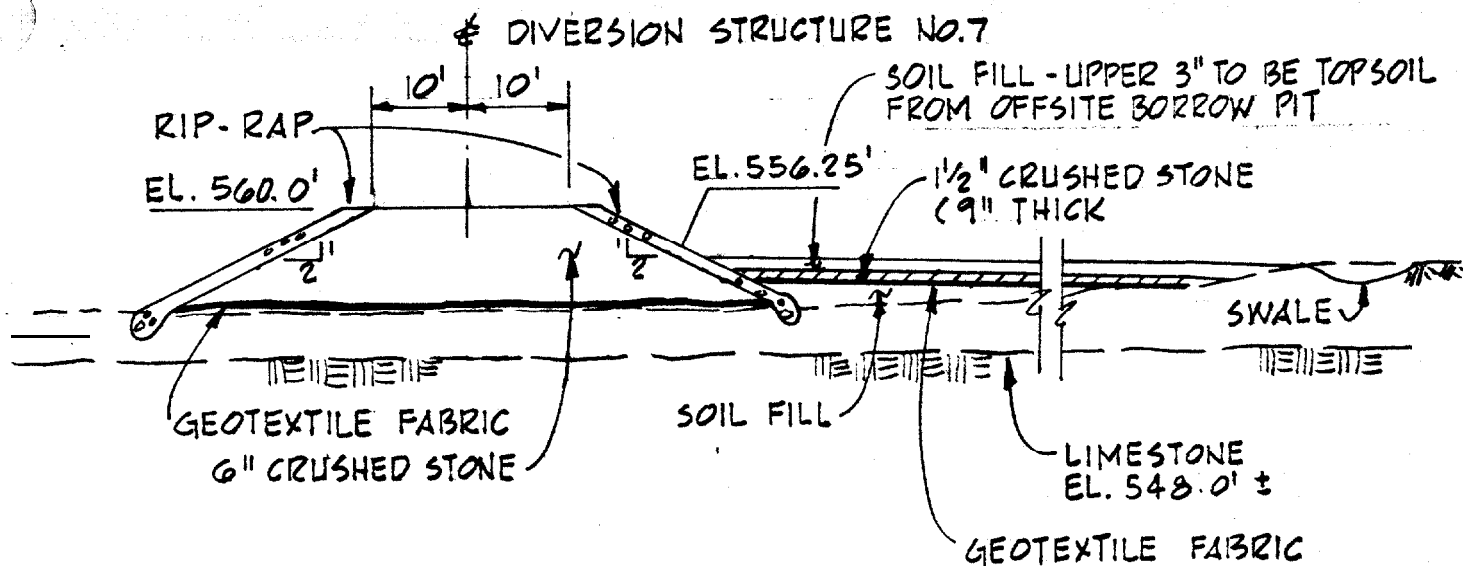
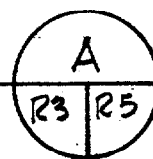
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* OMIT FOR DIVERSION STRUCTURE NO. 6

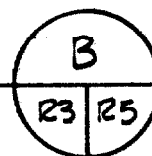
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SECTION

SCALE: 1" = 20'



ELEVATIONS REFER TO NAVD. - 1929

FOR PERMIT APPLICATION

Olin

HUNTSVILLE, ALABAMA
REMEDIAL ACTION PLAN
PHASE II
DIVERSION STRUCTURE
SECTIONS

WALDEMAR S. NELSON & CO., INC.
NEW ORLEANS, LA.
ENGINEERS AND ARCHITECTS

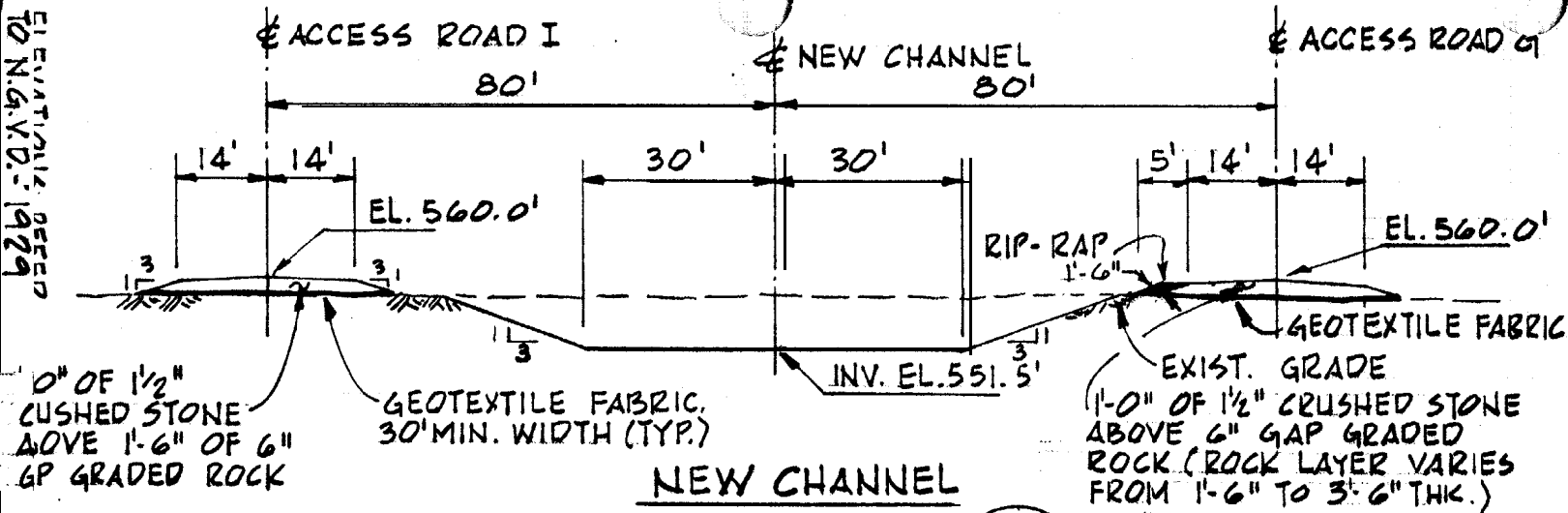
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DWG. R5 OF 8

REV.
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FOR PERMIT APPLICATION

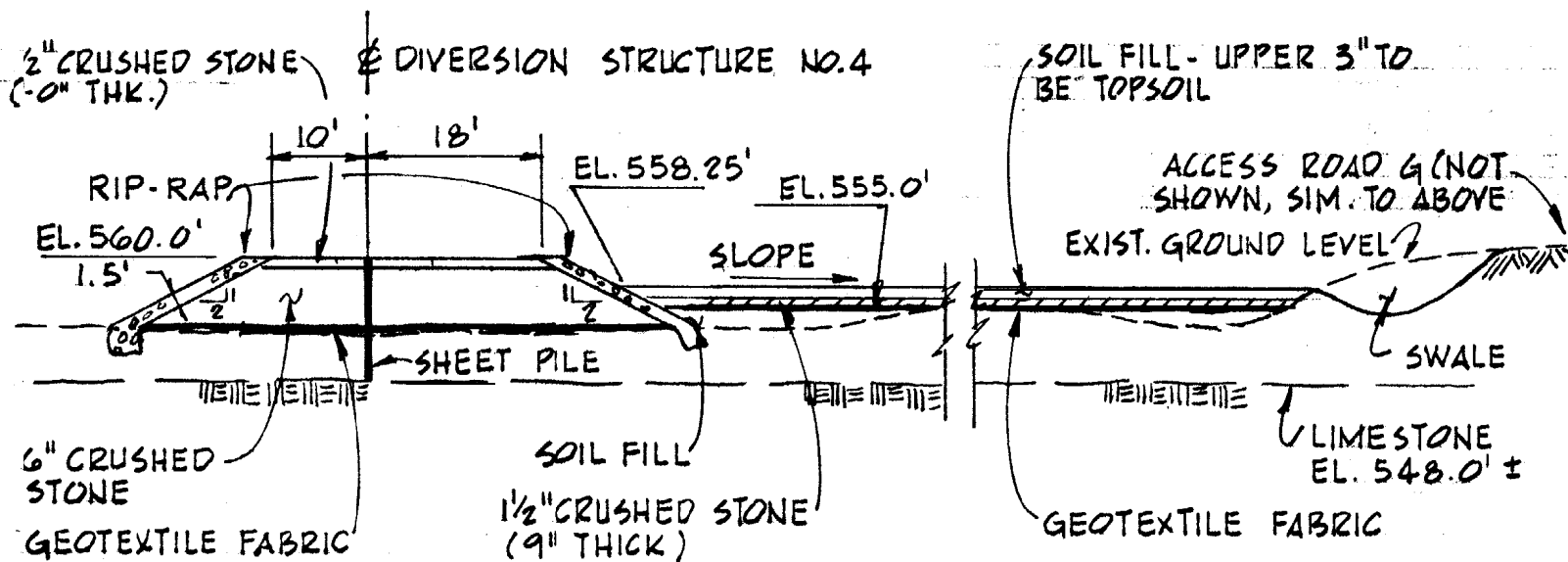
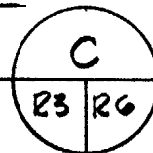
ELEVATION: DEER
TO N.G.V.D.: 1929



NEW CHANNEL

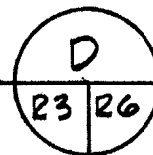
SECTION

SCALE : 1" = 30'



SECTION

SCALE: 1" = 20'



Olin

DRAWN BY S.V.N.

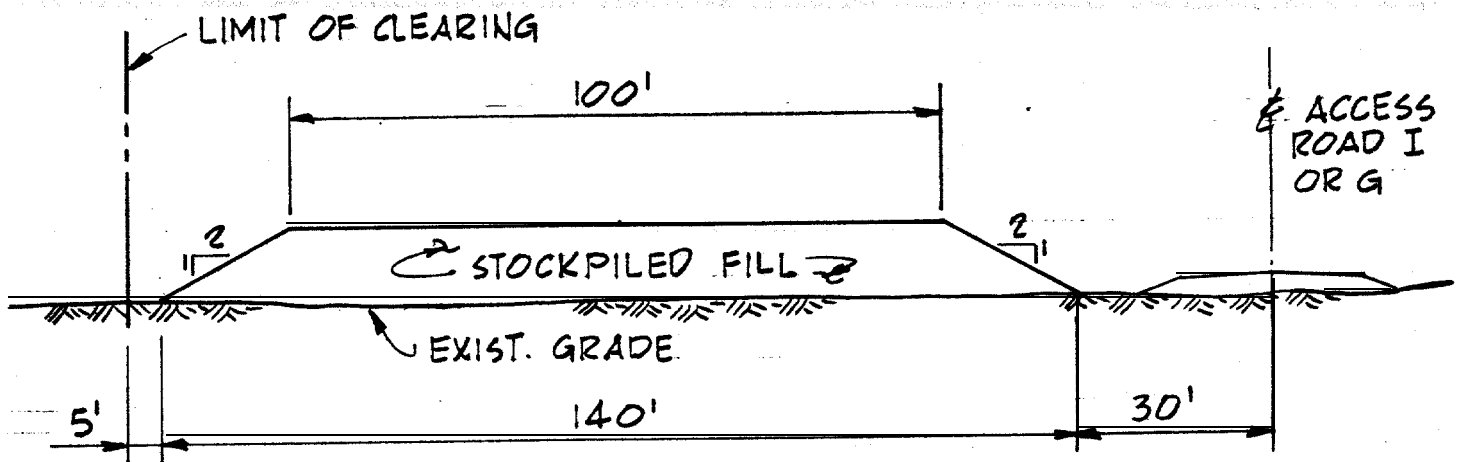
DATE 6-10-86

1

HUNTSVILLE, ALABAMA
REMEDIAL ACTION PLAN
NEW CHANNEL AND
DIVERSION STRUCTURE NO. 4
SECTIONS

Page 6 of 8

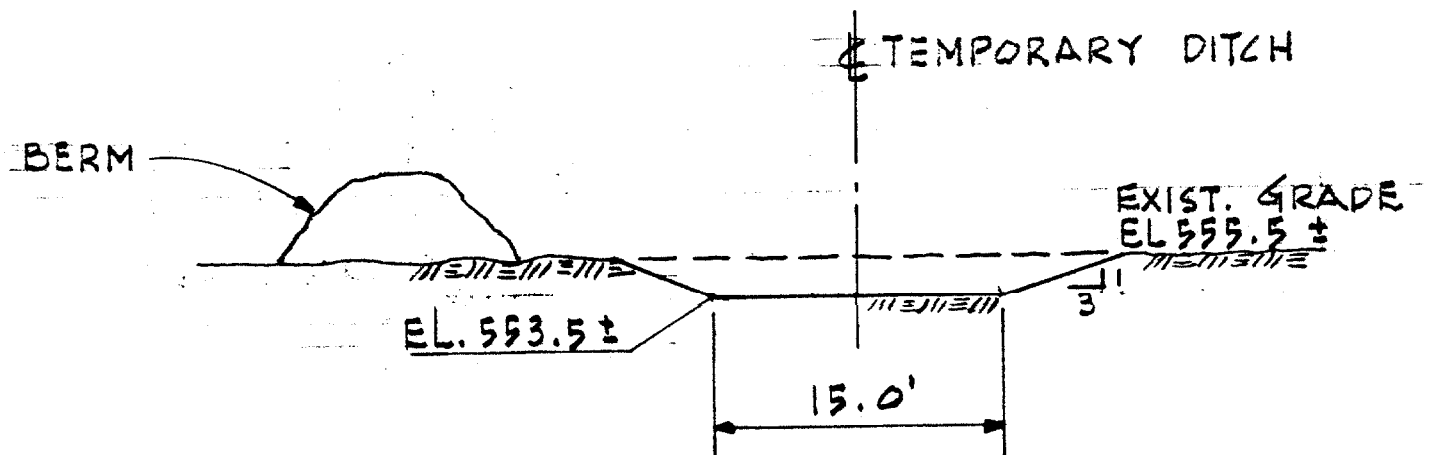
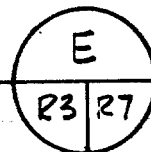
REV.



STOCKPILE AREA 1 & 2

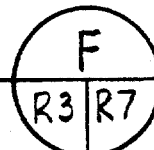
SECTION

SCALE: 1" = 30'



SECTION

SCALE: 1" = 10'



ELEVATIONS REFER TO N.G.V.D. - 1929

FOR PERMIT APPLICATION

WALDEMAR S. NELSON & CO., INC.
NEW ORLEANS, LA.
ENGINEERS AND ARCHITECTS

Olin

DRAWN BY S.M.N.	DATE 6-10-86
CHECKED BY	DATE
APP. BY	DATE
SPR. BY	DATE

HUNTSVILLE, ALABAMA
REMEDIAL ACTION PLAN
PHASE II
STOCKPILE & TEMPORARY DITCH
SECTIONS

DWG. R7 OF 8

REV.
1

WALDEMAR S. NELSON & CO., INC.
NEW ORLEANS, LA.
ENGINEERS AND ARCHITECTS

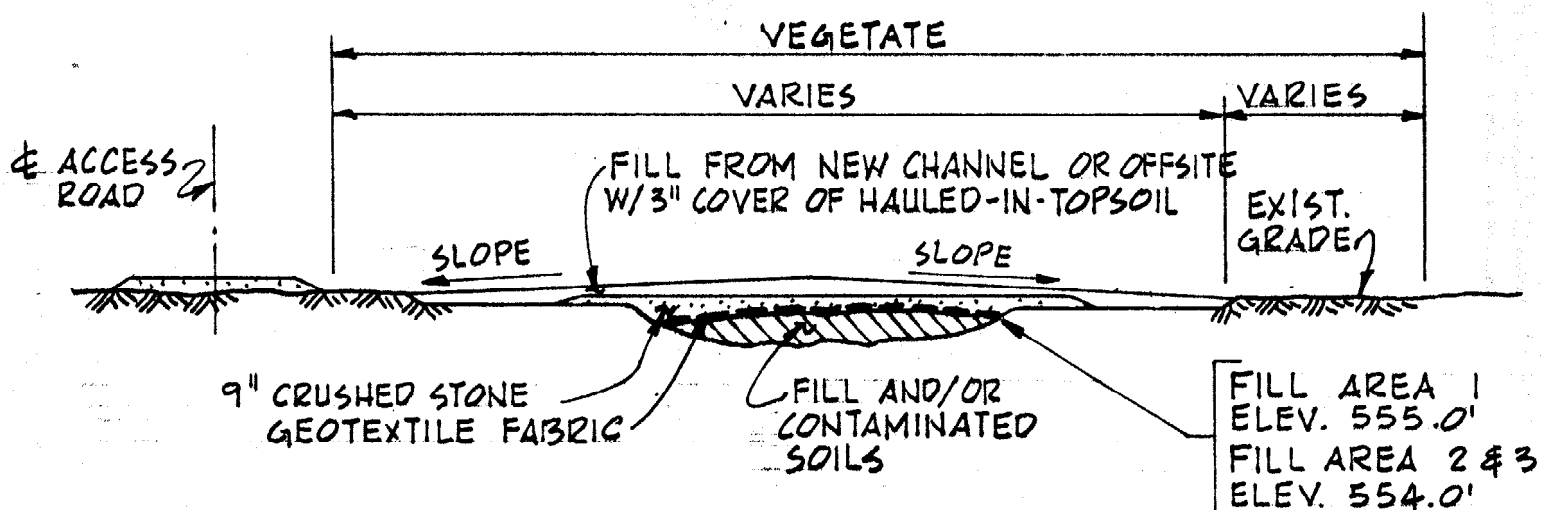
FOR PERMIT APPLICATION

ELEVATIONS REFER TO N.G.V.D. - 1929

Olin

DRAWN BY S.V.N. DATE 6-18-86
CHECKED BY DATE
APP. BY DATE

HUNTSVILLE, ALABAMA
REMEDIAL ACTION PLAN
PHASE II
FILL AREA SEQUENCE
DWG. R8 OF 8
REV. 1



SECTION FILL AREA 2
(SECTION FILL AREA 1 SIMILAR)

CONSTRUCTION SEQUENCE

1. CLEAR & GRUB TO CONSTRUCTION LIMITS.
2. CONSTRUCT ACCESS ROADS.
3. CONSTRUCT DIVERSION DITCH TO AND THRU. SOUTH LEVEE TO TEMPORARILY DIVERT HSB FLOW INTO DRAINAGE DITCH THRU. TAI, IF REQUIRED DUE TO HIGH WATER.
4. DEWATER CHANNEL IN SECTIONS.
5. DEPOSIT FILL FROM OFFSITE SOURCES TO ELEV.(AREA 1=555.0', AREA 2 & 3 = 554.0').
6. LAY GEOTEXTILE FABRIC ABOVE FILL MATERIAL.
7. HAUL IN CRUSHED STONE FILL & DEPOSIT ABOVE GEOTEXTILE FABRIC.
8. DEPOSIT FILL ATOP CRUSHED STONE
9. DEPOSIT TOPSOIL 3" MIN. LIFT ABOVE FILL MATERIAL.
10. REVEGETATE ENTIRE AREA.